

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 86

[FRL-5827-6]

Control of Air Pollution From Motor Vehicles and New Motor Vehicle Engines; Modification of Federal On-board Diagnostic Regulations for Light-Duty Vehicles and Light-Duty Trucks; Extension of Acceptance of California OBD II Requirements

AGENCY: Environmental Protection Agency.

ACTION: Notice of proposed rulemaking.

SUMMARY: Today's action proposes modifications to the federal on-board diagnostics regulations, including: harmonizing the emission levels above which a component or system is considered malfunctioning (i.e., the malfunction thresholds) with those of the California Air Resources Board (CARB) OBD II requirements; mandating that EPA OBD systems fully evaluate the entire emission control system, including the evaporative emission control system; indefinitely extending the allowance of deficiencies for federal OBD vehicles; indefinitely extending the allowance of optional compliance with the California OBD II requirements for federal OBD certification while also updating the allowed version of those California OBD II regulations to the most recently revised version; extending the current flexibility afforded alternate fueled vehicles through the 2004 model year rather than providing that flexibility only through the 1998 model year; updating the incorporation by reference of several recommended practices developed by the Society of Automotive Engineers (SAE) to incorporate recently published versions, while also incorporating by reference two standardization protocols developed by the International Organization for

Standardization (ISO). OBD systems in general provide substantial ozone benefits.

DATES: Comments must be received on or before [insert date 60 days after publication in the Federal Register]. A public hearing will be held on July 9, 1997. The hearing will begin at 10:00 a.m. and continue until all testimony has been presented. Requests to present oral testimony must be received on or before June 27, 1997.

ADDRESSES: Written comments should be submitted (in duplicate if possible) to: the EPA, Air Docket, Room M-1500 (Mail Code 6102), Waterside Mall, Attn: Docket A-96-32, 401 M Street, SW., Washington, DC 20460.

Materials relevant to this rulemaking are contained in Docket No. A-96-32. The docket is located at The Air Docket, 401 M. Street, SW., Washington, DC 20460, and may be viewed in room M1500 between 8:00 a.m. and 5:30 p.m., Monday through Friday. The telephone number is (202) 260-7548 and the facsimile number is (202) 260-4400. A reasonable fee may be charged by EPA for copying docket material.

The public hearing will be held at the Holiday Inn North Campus, 3600 Plymouth Road, Ann Arbor, MI.

FOR FURTHER INFORMATION CONTACT: Holly Pugliese, Vehicle Programs and Compliance Division, U.S. Environmental Protection Agency, 2565 Plymouth Road, Ann Arbor, Michigan 48105, Telephone 313-668-4288, or Internet e-mail at "pugliese.holly@epamail.epa.gov."

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I. Electronic Availability

Electronic copies of the preamble and the regulatory text of this final rulemaking are available via the Internet on the Office of Mobile Sources (OMS) Home Page (<http://www.epa.gov/OMSWWW/>). Users can find OBD related information and documents through the following path once they have accessed the OMS Home Page: "Automobiles," "I/M & OBD," "On-Board Diagnostics Files."

Electronic copies of the preamble and the regulatory text of this final rulemaking are also available on the Office of Air Quality Planning and Standards (OAQPS) Technology Transfer Network Bulletin Board System (TTN BBS). Users are able to access and download TTN BBS files on their first call. After logging onto TTN BBS, to navigate through the BBS to the files of interest, the user must enter the appropriate command at each of a series of menus. The steps required to access information on this rulemaking are listed below. The service is free, except for the cost of the phone call.

TTN BBS: 919-541-5742 (1,200 - 14,400 bps, no parity, eight data bits, one stop bit). Voice help: 919-541-5384 Internet address: TELNET ttnbbs.rtpnc.epa.gov Off-line: Mondays from 8:00 - 12:00 Noon ET.

1. Technology Transfer Network Top Menu: <T> GATEWAY TO TTN
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 7)
5. Inspection & Maintenance Rulemaking Areas: File Area

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At this stage, the system will list all available OBD Review files. To download a file, select a transfer protocol which will match the terminal software on your computer, then set your own software to receive the file using that same protocol.

If unfamiliar with handling compressed (i.e., ZIP'd) files, go to the TTN top menu, System Utilities (Command: 1) for information and the necessary program to download in order to unZIP the files of interest after downloading to your computer. After getting the files you want onto your computer, you can quit TTN BBS with the <G>oodbye command.

II. Introduction and Background

On February 19, 1993, pursuant to Clean Air Act section 202(m), 42 U.S.C. §7521(m), the EPA published a final rulemaking (58 FR 9468) requiring manufacturers of light-duty vehicles (LDVs) and light-duty trucks (LDTs) to install on-board diagnostic (OBD) systems on such vehicles beginning with the 1994 model year. The regulations promulgated in that final rulemaking require that manufacturers install OBD systems which monitor emission control components for any malfunction or deterioration causing exceedance of certain emission thresholds, and alert the vehicle operator to the need for repair. That rulemaking also requires that, when a malfunction occurs, diagnostic information must be stored in the vehicle's computer to assist the technician in diagnosis and repair.

Additionally, the original federal OBD regulations provide an allowance for manufacturers to satisfy federal OBD requirements through the 1998 model year by installing systems satisfying the California OBD II requirements pertaining to those model years. Beginning with the 1999 model year, manufacturers are required to satisfy the unique requirements of federal OBD.

In August 1996, EPA published a final rulemaking (61 FR 45898) updating the version of the California OBD II requirements that are acceptable for federal OBD compliance demonstration. The February 1993 final rulemaking allowed compliance with the 1992 version of California OBD II (Mail-Out #92-56). California subsequently revised their OBD II requirements in December of 1994. The August 1996 federal rule served to allow compliance with the revised California OBD II requirements (Mail-Out #95-34) rather than the 1992 version of OBD II.

In today's action, EPA is proposing a revision to the federal OBD regulations such that the allowance of compliance with the California OBD II regulations (excluding anti-tampering provisions) extends indefinitely, rather than applying only through the 1998 model year. EPA seeks this revision as a result of comments from the domestic and major import original equipment manufacturers who claim that the efforts to meet the unique federal OBD requirements will divert resources away from broader OBD development and calibration efforts. EPA believes that the benefits of a robust OBD program outweigh the benefits of the unique requirements of the federal OBD regulations. EPA also believes, as was noted in an August 30, 1996 final rule (61 FR 45898), that the California OBD II program fully meets the requirements of the 1990 Clean Air Act and fulfills the intent of the federal OBD program.

Today's action also proposes to amend federal OBD requirements to harmonize with those of the California OBD II requirements for 1999 and later model year light-duty vehicles (LDVs) and light-duty trucks (LDTs). This harmonization will result in federal OBD malfunction thresholds consistent with the California OBD II thresholds, and it will require monitoring of all emission-related powertrain components similar to the California OBD II regulations. EPA believes that this harmonization is consistent with the requirements of section 202(m) of the CAA and will not compromise the stringency of the federal OBD program.

Also being proposed is an extension of the current flexibility within the federal OBD requirements for alternate fueled vehicles. In a direct final rulemaking published in March 23, 1995 (60 FR 15242), EPA made an allowance for alternate fueled vehicles to comply with OBD requirements to the extent feasible through the 1998 model year, with full compliance required in the 1999 model year. With today's proposal, the flexibility provisions of the March 1995 direct final rule will extend through the 2004 model year, with full compliance required in the 2005 model year.

Also being proposed is the continuation of the allowance of deficiencies for federal OBD compliance. This allowance will extend indefinitely. Also being proposed is an updating of materials incorporated by reference. These materials, developed by the Society of Automotive Engineers (SAE) and the International Organization for Standardization (ISO), have been incorporated or proposed for incorporation in earlier rulemakings. More recent versions have been developed and/or published and are proposed for incorporation today.

III. Requirements of the Proposed Rule

A. Federal OBD Malfunction Thresholds and Monitoring Requirements

EPA is proposing that, beginning in the 1999 model year, OBD systems on spark-ignition LDVs and LDTs must be able to detect and alert the driver of the following emission-related malfunctions or deterioration:¹

- (1) Catalyst deterioration or malfunction before it results in an

The text presented here does not constitute proposed regulatory text, which can be viewed immediately following this preamble.

increase in HC emissions equal to or greater than 1.5 times the HC standard, as compared to the HC emission level measured using a representative 4000 mile catalyst system.

(2) Engine misfire before it results in an exhaust emission exceedance of 1.5 times the applicable standard for HC, CO or NOx.

(3) Oxygen sensor deterioration or malfunction before it results in an exhaust emission exceedance of 1.5 times the applicable standard for HC, CO or NOx.

(4) Any vapor leak in the evaporative and/or refueling system (excluding the tubing and connections between the purge valve and the intake manifold) greater than or equal in magnitude to a leak caused by a 0.040 inch diameter orifice shall also be detected. The absence of evaporative purge air flow from the complete evaporative emission control system shall also be detected.

(5) Any deterioration or malfunction occurring in a powertrain system or component directly intended to control emissions, including but not necessarily limited to, the exhaust gas recirculation (EGR) system, if equipped, the secondary air system, if equipped, and the fuel control system, singularly resulting in exhaust emissions exceeding 1.5 times the applicable emission standard for HC, CO or NOx shall also be detected.

(6) Any other deterioration or malfunction occurring in an electronic emission-related powertrain system or component not otherwise described above that either provides input to or receives commands from the on-board computer, and has a measurable impact on emissions or is used as part of the diagnostic strategy

for any other monitored system or component. Monitoring of components required by this paragraph shall be satisfied by employing electrical circuit continuity checks and, for computer input components, rationality checks (input values within manufacturer specified ranges) and, for output components, functionality checks (proper functional response to computer commands).

For compression-ignition engines, paragraphs 2, 3, and 4 above would not apply.

Upon detection of a malfunction, the malfunction indicator light (MIL) is to be illuminated and a fault code stored no later than the end of the next driving cycle during which monitoring occurs provided the malfunction is again detected. The only exception to this would be if, upon Administrator approval, a manufacturer is allowed to use a diagnostic strategy that employs statistical algorithms for malfunction determination (e.g., Exponentially Weighted Moving Averages (EWMA)). The Administrator considers such strategies beneficial for some monitors because they reduce the danger of illuminating the MIL falsely since more monitoring events are used in making pass/fail decisions. However, the Administrator will only approve such strategies provided the number of trips required for a valid malfunction determination is not excessive (e.g., six or seven monitoring events). Manufacturers are required to determine the appropriate operating conditions for diagnostic system monitoring with the limitation that monitoring conditions are encountered at least once during the first engine start portion of the applicable Federal Test Procedure (FTP) or a similar test cycle as approved by the Administrator.

B. Similar Operating Conditions Window

Also being proposed today is a revision to the engine operating conditions window associated with extinguishing the MIL for engine misfire and fuel system malfunctions. Currently, the federal OBD regulations require that, upon MIL illumination and diagnostic trouble code storage associated with engine misfire or fuel system malfunctions, the manufacturer is allowed to extinguish the MIL provided the same malfunction is not again detected during three subsequent sequential trips during which engine speed is within 375 rpm, engine load is within 10 percent, and the engine's warm-up status is the same as that under which the malfunction was first detected, and no new malfunctions have been detected. Today's proposed revision is to widen the engine load parameter from the current 10 percent value to 20 percent.

C. Extension of Allowance of California OBD II

EPA is proposing to extend the existing provision allowing optional compliance with the California OBD II requirements, excluding the California OBD II anti-tampering provisions, as satisfying federal OBD. This allowance will continue indefinitely, rather than being eliminated after the 1998 model year as currently specified. EPA is also proposing to update the version of California OBD II allowed for optional federal OBD compliance. Rather than the currently allowed CARB Mail-Out #95-34, the allowed version will be CARB's recently updated version contained in Mail-Out #96-34. This version of the California OBD II regulations contains proposed amendments to the OBD II regulations and is intended primarily for public comment purposes. After the final version of the revised OBD II regulations is completed, EPA will, in its final action on this proposal, allow compliance with that revised version provided relevant portions of that version are acceptable for federal OBD compliance demonstration. Manufacturers choosing the California OBD II demonstration option need not comply with

portions of that regulation pertaining to vehicles certified under the Low Emission Vehicle Program as those standards are not federal emission standards. Additionally, manufacturers choosing the California OBD II demonstration option need not comply with section (b)(4.2.2) which pertains to all vehicles regardless of emission standards. That section requires evaporative system leak detection monitoring down to a 0.02 inch diameter orifice and represents a level of stringency beyond that ever appropriately considered for federal OBD compliance. Lastly, manufacturers choosing the California OBD II demonstration option need not comply with section (d) which contains the anti-tampering provisions of the California OBD II regulations.

D. Extension of Allowance of OBD Deficiencies for Federal OBD Vehicles

Today's action proposes to extend the current flexibility provisions (i.e., "deficiency provisions") contained in §86.094-17(i) indefinitely, rather than being eliminated beyond the 1998 model year. This will allow the Administrator to accept an OBD system as compliant even though specific requirements are not fully met. This provision neither constitutes a waiver from federal OBD requirements, nor does it allow compliance without meeting the minimum requirements of the CAA (i.e., oxygen sensor monitor, catalyst monitor, and standardization features).

E. Provisions for Alternate Fueled Vehicles

EPA is proposing to extend the current flexibility provision for alternate fuel vehicles through the 2004 model year. Such vehicles will be expected to comply fully with the OBD requirements proposed today during gasoline operation (if applicable), and during alternate fuel

operation except where it is technologically infeasible to do so. Any manufacturer wishing to utilize this flexibility provision must demonstrate technological infeasibility concerns to EPA well in advance of certification application.

F. Applicability

Today's proposed revisions to federal OBD malfunction thresholds, monitoring requirements, deficiency provisions, alternate fuel provisions, and the recommended practices incorporated by reference apply to all 1999 and later model year light-duty vehicles and light-duty trucks for which emission standards are in place or are subsequently developed and promulgated by EPA. Today's proposed actions to extend the allowance of optional compliance with California OBD II and to update the acceptable version of the California OBD II regulation apply to 1998 and later model year vehicles.

G. Update of Materials Incorporated by Reference

Also being proposed is the adoption of ISO 9141-2 entitled "Road vehicles -- Diagnostic systems -- Part 2: CARB requirements for interchange of digital information," as an acceptable protocol for standardized on-board to off-board communications. This standardized procedure was proposed in September 24, 1991 (56 FR 48272), but could not be adopted in the February 1993 final rule because the ISO document was not yet finalized. ISO 9141-2 has since been finalized and is incorporated by reference in today's proposed regulatory language.

Today's action also proposes the incorporation by reference of ISO 14230-4, "Road vehicles - Diagnostic systems - KWP 2000 requirements for Emission-related systems," as an acceptable protocol for standardized on-board to off-board communications. This standardized procedure

contains a more up-to-date communication protocol than that contained in ISO 9141-2. Today's action also proposes to incorporate updated versions of the SAE procedures referenced in the current OBD regulation. These SAE documents are J1850, J1979, J2012, J1962, J1877 and J1892.

H. Certification Provisions

The certification provisions associated with OBD, contained in proposed section 86.099-30, will be appropriately revised to reflect the proposed changes to the OBD malfunction thresholds and monitoring requirements.

IV. Discussion of Issues

A. Federal OBD Malfunction Thresholds

The OBD malfunction thresholds promulgated by EPA in 1993 are based on emission increases above a baseline level for any particular vehicle. In other words, any malfunction or component deterioration should be detected prior to emissions increasing above the non-malfunctioning and/or non-deteriorated emission level by an amount equal to the given threshold. For example, all OBD systems currently must be able to detect oxygen sensor deterioration before it results in an exhaust emissions increase of greater than 0.2 g/mi HC, 1.7 g/m CO, or 0.5 g/mi NOX. The emission increase would be measured relative to the baseline level for the vehicle. EPA interprets the baseline level to be the vehicle's emissions under normal, properly operating conditions.

EPA is proposing to substitute this approach with an approach consistent with that in the California OBD II regulations. Manufacturers have argued on several occasions that EPA should continue to allow optional compliance with California OBD II for the purpose of

demonstrating compliance with the federal OBD program. Their primary purpose in making this argument is to avoid the need to recalibrate their OBD systems to the unique federal OBD thresholds. EPA agrees with that argument and can see no cost effective value in requiring calibration to two similar but distinct sets of OBD thresholds. In addition, EPA believes revision of its OBD thresholds is appropriate because EPA's current thresholds, based on increases over baseline emission levels, could result in requirements for MIL illumination even at emission levels below the applicable standards.

Today's proposal will revise the federal OBD malfunction thresholds such that, in general, they are based not on baseline emissions, but rather the emission standards themselves. The proposed regulations will require identification of misfires and malfunction of oxygen sensors and all other powertrain systems or components directly intended to control emissions (e.g., evaporative purge control, EGR, secondary air system, fuel control system) when emissions exceed the specified emission threshold, which will be set at 1.5 times the applicable emission standard. For evaporative leak detection, as discussed in more detail in section C, "Expanded Federal OBD Monitoring Requirements," today's proposal eliminates the current 30 g/test emission threshold and instead requires detection of any hole equivalent to or greater in size to one with a 0.04 inch diameter. For catalyst deterioration, the proposed threshold is an increase of 1.5 times the applicable standard compared to emissions from a representative catalyst run for 4000 miles. This threshold is consistent with California's threshold for detection of catalyst malfunction or deterioration. As discussed further in section C, this proposal also would require monitoring of emission-related powertrain components that provide information to and receive commands from the on-board computer whose malfunction may impact emissions or may impair the ability of the OBD system to perform its job (e.g., throttle position sensor, coolant

temperature sensor, vehicle speed sensor, etc.). Monitoring of these components must include, at a minimum, electrical circuit continuity checks, and effective rationality and/or functionality checks. Deterioration or malfunction of these components would be identified when a component failed the circuit continuity check or the rationality and/or functionality checks.

While EPA believes that the proposed changes to the malfunction thresholds will not be controversial to OEMs in general, issues still exist. The Agency is concerned that this proposal may penalize those OEMs who have proactively set out to meet the federal OBD thresholds ahead of the existing 1999 model year cutoff of optional California OBD II compliance. It may also penalize those small volume manufacturers who may not have any plans for California vehicle sales and have thus concentrated development efforts solely on the existing federal OBD thresholds. EPA requests comment on the significance of this issue, and requests suggestions on how best to resolve the issue while also satisfying the Agency's desire to harmonize the federal and California OBD requirements.

Another issue for discussion is that of threshold stringency. In most cases, the California OBD II thresholds are more stringent than the current federal thresholds. However, in some cases, the current federal OBD malfunction thresholds are actually more stringent than the California OBD II thresholds, particularly for Tier I light-duty trucks. In particular, the current federal OBD thresholds can in some cases require OBD detection and MIL illumination for malfunctions in systems and components specifically used for emission control (e.g., EGR, evaporative purge, secondary air) even though vehicle emissions may be below the emission standards. This, by definition, is lower than requiring MIL illumination at 1.5 times the standard. Given that vehicles are required to meet emission standards, it can be argued that manufacturers should not be required to illuminate the MIL when

emissions are below those standards. EPA is sympathetic to the consumer and the potential for seeking repair of systems or components used specifically for emission control when no direct emission standards are being violated. It should be noted that the revised malfunction thresholds will effectively be no different, and in some cases will be more stringent, for the major emission control component monitors (i.e., catalyst, oxygen sensor, and engine misfire).

EPA is interested in any comments surrounding this issue and the significance of its concern. Since the majority of the OEM industry has repeatedly requested that EPA continue allowing optional compliance with California OBD II as satisfying federal OBD, and this proposed change results in federal OBD thresholds consistent with those contained in the California OBD II requirements, EPA believes that the proposed change to federal OBD malfunction thresholds should be satisfactory and noncontroversial to those OEMs. In addition, EPA believes that these revisions are consistent with the requirements of CAA Section 202(m) and are technologically feasible.

B. Similar Operating Conditions Window

Another provision proposed today is to widen the engine load range defining the similar operating conditions window. The proposal is to widen that range from the current 10 percent value to 20 percent. This window is used to determine when operating conditions for fuel system and misfire malfunctions are again within the same operating window to determine whether or not a previously detected malfunction is still present. This window is used because malfunctions in the fuel control system and those associated with engine misfire tend to happen at specific operating conditions, rather than occurring during all modes of operation. As a result, when a fuel system or misfire malfunction is detected, the operating conditions window is stored in memory. During a

subsequent trip where operating conditions again enter that similar conditions window, the presence of a malfunction will result in MIL illumination. If, after three trips where similar operating conditions are again encountered without the malfunction recurring, the MIL can be extinguished provided no other MIL illuminating malfunction has been detected.

This similar operating conditions window is being widened due to difficulties in entering the current 10 percent window during subsequent trips. This can result in an inability to extinguish a MIL for a malfunction that is no longer occurring. For example, if a cylinder misfires on a four cylinder car due to water in the gasoline, then it will likely be very difficult to extinguish the MIL after refilling with better gasoline because the engine load characteristics at any given RPM will be very different while again running consistently on all four cylinders.

The result of this proposed change is an increased latitude in entering the wider similar conditions window on subsequent trips resulting in a greater likelihood of extinguishing the MIL for malfunctions that are no longer occurring. This proposed change will not make it easier for the manufacturer to extinguish the MIL for malfunctions that are still occurring, nor will it make it less likely that the malfunction will be appropriately identified and flagged. For these reasons, EPA knows of no issues surrounding this proposed change, but is open to any comments.

C. Expanded Federal OBD Monitoring Requirements

The federal OBD requirements contained in 40 CFR 86.094-17 require that the OBD system monitor proper functionality of the catalyst and oxygen sensor, and monitor and detect engine misfire (including identification of the particular misfiring cylinder(s)) and detect

electrical disconnection of the evaporative purge control and any emission-related powertrain component or system which directly or indirectly sends information to or receives information from the vehicle's computer. Implied in those requirements is that any functional deterioration or malfunction of an emission-related powertrain component other than the catalyst, the oxygen sensor, or an engine misfire related component not causing exceedance of the malfunction thresholds does not require detection. The philosophy of the original federal OBD program was that those emission-related powertrain components unlikely to malfunction or unlikely to malfunction in a way so as to increase emissions above the malfunction thresholds need not be monitored for anything more than electrical circuit continuity (i.e., functionality and rationality checks need not be done).²

Also, the malfunction detection threshold placed on evaporative leak detection is currently 30 g/test. Because of advancements made to evaporative emission control systems, this threshold is proving to be insufficiently stringent, and provides little incentive to place an evaporative system leak detection monitor on the vehicle or prevent leaks from occurring because even relatively large leaks can sometimes

A rationality check is a diagnostic strategy whereby the on-board computer analyzes the electronic signal sent by a sensor and compares that to a known range of appropriate values. For example, a coolant temperature sensor reading 70 degrees F after 10 minutes of vehicle operation is not providing rational information to the on-board computer because coolant temperature should be much higher after 10 minutes of operation. Therefore, the system should be identified as malfunctioning. A functionality check is a diagnostic strategy whereby the on-board computer analyzes the functional response of a component after first sending a functional command to that component. If the desired functional response does not occur, the component should be identified as malfunctioning.

emit fewer vapors than 30 grams during a diurnal test.³

With today's proposal, the federal OBD program adopts the philosophy originally built into the California OBD II program, in that all emission-related powertrain components must be monitored. The proposed regulation would require that all powertrain components specifically intended to control emissions (e.g., evaporative purge control, EGR, secondary air system, fuel control system) be monitored. This proposal also would require monitoring of all other emission-related powertrain components that provide information to and receive commands from the on-board computer whose malfunction may impact emissions or may impair the ability of the OBD system to perform its job (e.g., throttle position sensor, coolant temperature sensor, vehicle speed sensor, etc.). Monitoring of these components must include, at a minimum, electrical circuit continuity checks, and effective rationality and/or functionality checks.

The primary OBD monitoring system impacted by this proposed change is the evaporative system leak detection monitor. The proposed regulations require an evaporative leak detection monitor while, originally, the Agency intended the federal OBD requirement to allow for certification without the evaporative leak detection monitor provided both the manufacturer and EPA were confident that the design of the evaporative emission control system was robust enough so as not to fail during in-use operation. However, only one major manufacturer has taken advantage of this allowance, and even that manufacturer has used this allowance on only a portion of their production fleet. All other major manufacturers have apparently decided that they do not have sufficient

While below 30 grams, the vapors emitted should by no means be considered insignificant. See EPA's rulemaking decision on the enhanced evaporative emission control system for more information on the significance of evaporative emissions on urban air quality (58 FR 16002, March 24, 1993).

confidence in their evaporative emission control system to warrant removing the monitor, or they have decided that it is more cost effective to implement the monitor on federally certified vehicles rather than to recalibrate those vehicles for sale without it. Additionally, many state I/M representatives have expressed concerns with the current federal OBD allowance for certification without an evaporative leak detection monitor. These representatives are eager for widespread OBD implementation such that their I/M programs can rely on OBD checks as replacement for emission tailpipe and/or evaporative tests. They are concerned about their ability to rely solely on the OBD system for I/M purposes given the future potential that more manufacturers will sell vehicles without the OBD evaporative leak detection monitor. Should more manufacturers make use of that current federal OBD allowance, and without some form of I/M evaporative system test, they will be left without any kind of evaporative system evaluation.

The Agency has altered its OBD philosophy, in part, as an effort to enhance the role of OBD in future I/M programs. Like the state representatives referred to above, the Agency also hopes that current emission test based I/M programs can be replaced with a much less time consuming and more cost efficient check of the OBD system. However, without monitors on all emission-related components, particularly the evaporative system leak detection monitor, the OBD-only based I/M program is not as likely to occur due to its potential for more limited evaluation of the vehicle.

Further, the Agency believes that mandating these monitors will not adversely affect the federal OBD program nor will it pose undue burden on the OEMs. In fact, under the federal OBD rulemaking in February 1993, though EPA did not mandate all the monitors mentioned, the manufacturer was still held responsible for any adverse affects that those systems, if malfunctioning, could potentially cause.

Additionally, the Agency fully believes that the feasibility of expanded monitoring requirements is well established as argued in the recent California OBD II waiver decision (61 FR 53371, October 11, 1996). Further, many OEMs have already certified to federal OBD by demonstrating compliance with California OBD II requirements. Lastly, many OEMs have indicated their willingness to participate in the National Low Emission Vehicle (NLEV) program, which includes California OBD II monitoring requirements. This suggests that expanded monitoring requirements as proposed today are fully acceptable to at least the majority of the OEM industry. For these reasons, today's proposed change is not expected to result in any increased costs associated with the federal OBD program over original estimates.⁴

The Agency does have some concerns regarding this issue, similar to the concerns expressed in Section IV(A). The expansion of mandatory monitors may penalize those OEMs who have proactively set out to design a federal OBD system ahead of the 1999 model year cutoff of optional California OBD II compliance. It may also penalize those small volume manufacturers who may not have any plans for California vehicle sales and have thus concentrated development efforts solely on a federal OBD system. However, the Agency also has concerns over the effectiveness of an OBD based I/M program without having OBD monitoring of essentially the entire emission control system.

The Agency requests comment on today's proposed expansion of mandatory monitors under the federal OBD program. Of particular interest are comments from those manufacturers that have concentrated on designing a unique federal OBD system due to the more limited mandatory monitoring requirements. The Agency will consider the possibility of providing a two year phase-in period in the form of a carry-over

The original cost estimate outlined in 58 FR 9468, February 19, 1993, included the costs associated with evaporative leak detection monitoring.

allowance for compliance with the proposed federal OBD revisions; any phase-in period will apply only to those vehicles certified to the unique federal OBD requirements in the 1998 model year. Also of interest are comments from state Inspection and Maintenance program officials regarding their concern over the potential that, without the revisions proposed, federal OBD systems will not have all of the monitors currently required in the California OBD II program.

D. Extension of Allowance of California OBD II

Today's action proposes to extend indefinitely the allowance for manufacturers to comply with federal OBD requirements by optionally complying with California OBD II. The allowance for optional compliance with California OBD II has already been established in the federal OBD program and was incorporated into the federal OBD final rulemaking in February 1993 [58 FR 9468, February 19, 1993]. However, in that final rulemaking, and in an August 1996 final rule [61 FR 45898, August 30, 1996], the Agency provided that allowance only through the 1998 model year.

Additionally, today's proposed action seeks to update the version of the California OBD II regulation that is applicable for federal OBD compliance beginning with the 1998 model year. This action is similar to an action taken in the August 1996 final rule that updated the applicable version of the California OBD II regulation. However, since that time, CARB has again made several revisions to the California OBD II regulations, some of which apply to federal Tier I type vehicles. These revisions provide some relief from earlier versions of OBD II, but they are relatively minor and do not affect the overall soundness of the OBD II program.

Both of these changes, updating the applicable version of the OBD II regulations and extending indefinitely the allowance of California OBD II for federal OBD compliance, are being proposed for the sake of

harmonization of OBD related requirements between California and EPA. Most of the original equipment industry has repeatedly requested that EPA continue to accept the California OBD II regulations so as to avoid the need for major vehicle recalibrations as part of complying with the similar but distinct federal OBD requirements. Further, all 1998 and beyond model year California OBD II vehicles will be designed and certified according to the recently revised OBD II regulation, rather than the 1995 version. As a result, EPA must update the applicable version of the OBD II regulation to which compliance can be shown for federal OBD purposes.

As a result of this proposed action, any federal vehicles complying with federal OBD by optionally complying with California OBD II are allowed the same deficiencies as allowed under the California OBD II provisions. Note, however, that a manufacturer requesting certification of a deficient California OBD II system must receive EPA acceptance of any deficiency independently of an acceptance made by CARB. The Agency will use the same criteria specified by CARB in their OBD II regulation (Those criteria being the extent to which the requirements are satisfied overall on the vehicle applications in question, the extent to which the resultant diagnostic system design will be more effective than earlier OBD systems, and a demonstrated good-faith effort to meet the requirements in full by evaluating and considering the best available monitoring technology.), except that EPA will not provide deficiency allowances for lack of catalyst monitors or oxygen sensor monitors because the Clean Air Act specifically requires these monitors no later than the 1996 model year. Moreover, EPA will grant such deficiencies based upon the same premise expressed in section IV(E) with regard to granting deficiencies for federal OBD vehicles. The Agency will make every effort to determine the acceptability of California OBD II deficiency requests in concert with CARB staff to avoid the potential for conflicting determinations. However, the extent

to which the agencies can make concurrent and coordinated findings will rely heavily on the manufacturer, who will be expected to provide any necessary information to both agencies in parallel rather than pursuing deficiency determinations on a separate basis.

E. Extension of Allowance of OBD Deficiencies for Federal OBD Vehicles

Despite the best efforts of manufacturers, many have needed to certify vehicles with some sort of deficiency when unanticipated problems have arisen that could not be remedied in time to meet production schedules. Given the relative newness and, most importantly, the considerable complexity of designing, producing, and installing the components and systems that make up the OBD system, manufacturers have expressed and demonstrated difficulty in complying with every aspect of the OBD requirements. Furthermore, this difficulty appears likely to continue indefinitely. The Agency believes that 100 percent compliance can be achieved, but EPA believes that some sort of relief must be provided to allow for certification of vehicles that, despite the best efforts of the manufacturers, have deficient OBD systems.

The EPA "deficiency" allowance should not be seen as a waiver of any kind. Though EPA will accept minor deficiencies, EPA will not accept any deficiency requests that include the complete lack of a required diagnostic monitor, with the possible exception of the special provisions being proposed today for alternate fueled vehicles. In fact, EPA expects to implement this deficiency allowance primarily for software or calibration type problems, as opposed to cases where hardware is at fault. This is EPA's expectation due to a belief that, despite unintended and unforeseen software problems occurring on these complicated computer controlled systems, manufacturers should have functioning OBD hardware in place, especially now that OBD regulations

have been in existence for several years. Furthermore, EPA does not intend to certify vehicles with federal OBD systems that have more than one OBD system deficiency, and EPA will not allow carryover of any deficiency to the following model year unless it can be demonstrated that correction of the deficiency requires hardware modifications that absolutely cannot be accomplished in the time available, as determined by the Administrator. These limitations are intended to prevent a manufacturer from using the deficiency allowance as a means to avoid compliance or delay implementation of any OBD monitors or to compromise the overall effectiveness of the OBD program. The Agency proposes that the "deficiency" allowance be provided indefinitely, and requests comment on concerns surrounding this proposal.

F. Diagnostic Readiness Codes

Because of the considerable confusion regarding the setting and clearing of diagnostic readiness codes, or I/M readiness codes, this section serves to provide EPA's interpretation of its regulations on these codes. The original OBD final rulemaking of February 1993, required that, absent the presence of any fault codes, separate status codes shall be used to identify correctly functioning emission control systems and those systems which need further vehicle operation to be fully evaluated. The purpose behind the readiness code is to allow an inspection and maintenance (I/M) official to determine whether or not a vehicle has undergone sufficient operation to allow the OBD system to fully evaluate the emission control system. This way, the I/M official could be certain that the lack of OBD diagnostic trouble codes could be interpreted to mean that the vehicle was operating cleanly, rather than perhaps being an indication that the OBD system simply had not had time to fully evaluate the vehicle.

Many manufacturers have had difficulty interpreting exactly what

was expected via this requirement. Some manufacturers have interpreted the requirement to mean that with every "key-on," the readiness codes should be set to "not ready" status. However, such an approach effectively defeats the purpose behind the readiness code since any vehicle having been turned off while waiting for the I/M inspection would subsequently be interpreted as "not ready" for I/M inspection.

Therefore, to clarify, the readiness code, for those monitors having associated readiness codes, should be set to "ready" status only after sufficient vehicle operation such that the monitor has been properly exercised and a valid determination can be made as to the component's or system's operational status. Generally, this equates to two driving cycles, where driving cycle is defined as vehicle operation during which a particular monitor is exercised. Note that a driving cycle may be different for different monitors, and not all monitors have associated readiness codes. For example, continuously operating monitors are considered "ready" since they operate continuously rather than during only limited operating conditions; therefore, such monitors may not have an associated readiness code.

The readiness codes should never be set to "not ready" status by any means other than intentional resetting via a scan tool or perhaps due to battery power interruption. Further, when setting a readiness code to "not ready" status using a scan tool (after conducting any necessary repairs), all readiness codes should be set to "not ready" rather than resetting only the readiness code associated with the repaired component. In other words, readiness codes should be set to "not ready" status as a group rather than individually. This will serve to ensure adequate vehicle operation and OBD system evaluation following vehicle repairs and prior to subsequent I/M inspections.

G. EPA Recall Policy

Because the Agency has received numerous questions regarding its recall policy relative to OBD, this section serves to clarify the issue. Under the federal OBD program, a decision to recall the OBD system for recalibration or repair, or a replacement of a malfunctioning component, will depend on factors including, but not limited to, the level of emissions above applicable standards, whether the defect is uniform over the entire engine family or limited to a sub-class of the engine family, or the presence of any identifiable faulty or deteriorated components which affect emissions with no MIL illumination.

In the case of an OBD system failing to identify an infrequent component failure, the OBD system, not the component, would be the subject of the recall and that recall would occur only if the determination were made that the "failure to identify" would occur on a substantial number of vehicles of the same general OBD design and/or monitoring strategy. Therefore, in the Agency's opinion, if evidence supports that an identical malfunction could occur with sufficient probability without being flagged by a similar OBD system design and/or monitoring strategy, that OBD system design is inadequate and has failed or would fail to detect that malfunction. Such a determination would provide little confidence in that OBD monitor or strategy to properly monitor during in-use operation, and, therefore, it should be recalled.

H. Extension of Provisions for Alternate Fueled Vehicles

In a direct final rulemaking published March 23, 1995 (60 FR 15242), EPA made an allowance for alternate fueled vehicles to comply with federal OBD requirements to the extent feasible through the 1998 model year, without being required to include monitoring strategies for which the effects of alternate fuels are of technological concern. Beginning with the 1999 model year, full compliance with all federal OBD requirements would be expected. This one to two year delay in full OBD

implementation was provided because industry argued they had not had sufficient lead time to properly assess the effects of alternate fuels on OBD monitoring strategies. As a result, there was considerable concern within industry and EPA regarding whether monitoring strategies for alternate fueled vehicles could be developed within the available time. Thus, the OBD requirements were presenting a roadblock to development of alternate fueled vehicles. The delay allowed manufacturers more lead time to design and develop OBD strategies suited for alternate fuels, and thus allowed greater production of alternate fueled vehicles.

All of these arguments for additional lead time still exist at this time. Many technological aspects of alternate fueled vehicles that provide environmental benefits also cause problems in terms of OBD monitoring strategies. The uncertainty involved with alternate fueled vehicles is a result of their unknown effects on emission components, and the variability of deterioration characteristics of monitors and sensors with which the fuels come into contact. The technology-forcing nature of OBD regulations has required industry to concentrate almost exclusively on developing new OBD strategies for gasoline vehicles and making improvements to existing strategies. Additional lead time, beyond that mentioned above, would provide the opportunity for more data collection from in-use alternate fueled vehicles to evaluate the unique effects of these fuels on emission control system components and the corresponding OBD system monitors.

EPA recently contracted SouthWest Research Institute to study the technological feasibility and lead time issues associated with OBD systems and alternate fueled vehicles. The study (On-Board Diagnostics - Second Generation (OBD-II) System Criteria for Alternate-Fueled Vehicles, Final Report, Melvin N. Ingalls, Sep. 1996) (EPA Air Docket A-96-32, I-A- 01) supports EPA's independent analyses that the manufacturers of alternate fueled vehicles still face considerable

challenges in incorporating fully functional OBD systems into the design of these vehicles. The report concluded, as stated in the Executive Summary, "Aftermarket conversions (the majority of gaseous fuel vehicles are conversions) have a particularly great need for further OBD system development. The CNG and LPG industry press (magazines, newsletters, and the like) identify OBD-II as the biggest problem facing vehicle conversion companies."

Therefore, EPA is proposing to extend the existing provision for alternate fueled vehicles to allow additional lead time for full compliance with federal OBD through the 2004 model year with full compliance required in the 2005 model year. The additional OBD development time will allow manufacturers (both OEM and converters) to evaluate the effects of alternate fuels on emission control system performance and thus ensure that OBD diagnostic strategies will be reliable in-use. EPA believes that EPA certified alternate fueled vehicles can provide environmental benefits relative to gasoline vehicles, and EPA is committed to seeing larger volumes of EPA certified alternate fueled vehicles produced and sold. Note that this flexibility is intended to apply only during operation on an alternate fuel and even then the flexibility applies only to the extent manufacturers can show that diagnostic strategies for alternate fuel operation are technologically infeasible. Manufacturers will be required to implement monitoring strategies to the extent feasible, but will not be required to include monitoring strategies the reliability of which are still doubtful for alternate fuel operation. To further clarify, EPA will expect that vehicles designed for use on more than one fuel (i.e., flexible fuel vehicles) have fully operating OBD systems upon initial sale. Should a non-gasoline fuel then be introduced, the monitors affected by the alternate fuel could be deactivated to the extent the manufacturer can show that reliable diagnostic strategies are infeasible. Therefore, if the vehicle is not fueled by an alternate

fuel, the OBD system will be fully functioning.

Authority for this proposal exists under section 202(m)(1)(A). That section clearly states that OBD systems be required that can accurately identify emission-related system deterioration or malfunction. While gasoline technologies have been developed that can accurately detect such problems, EPA does not believe that sufficient evidence has been demonstrated at this time showing that OBD systems will perform accurately while operating on alternate fuels. To the extent such evidence becomes available prior to model year 2005, or to the extent technological infeasibility cannot be demonstrated, manufacturers will be less able to use these flexibility provisions.

I. Update of Materials Incorporated by Reference

The Agency is not aware of any potential issues surrounding the inclusion of either ISO 9141-2, or ISO 14230-4 into the federal OBD regulations, or updating the SAE Recommended Practices already incorporated by reference. ISO 9141-2 and ISO 14230-4 are similar in nature to SAE J1850, which outlines standardized means of on-board to off-board computer communications. The details of all the materials proposed for Incorporation by Reference are contained in 40 CFR 86.1 and 86.099-17 (h). Nonetheless, the Agency is open to any comments regarding the materials proposed today for incorporation by reference.

V. Cost Effectiveness

This proposed rulemaking alters an existing provision by revising the current federal OBD malfunction thresholds. These revisions will result in essentially equivalent stringency for the major emission control system monitors, while slightly relaxing stringency in certain cases for some more minor emission control system monitors. Because

most of industry has requested that EPA harmonize emission thresholds with the California OBD II thresholds as a means to minimize resource requirements, EPA believes that today's proposal will provide cost savings to those OEMs certifying solely to the California OBD II thresholds by eliminating the need to incur significant recalibration costs and efforts for the 1999 model year.

However, EPA is aware that some OEMs, particularly extremely small volume import manufacturers, may have concentrated their efforts on the unique federal OBD malfunction thresholds. EPA believes that the primary cost imposed on these particular OEMs associated with today's proposal would be for the mandatory evaporative system leak detection monitoring. These systems have been estimated by EPA to cost \$18 per vehicle (58 FR 9483). The Agency believes that mandating the evaporative system leak detection monitor would not increase the cost of the federal OBD program. The cost of this monitor was taken into consideration in the original federal OBD regulations (58 FR 9468) even though this monitor was originally optional. Additionally, these extremely small volume import manufacturers will be required to reevaluate their OBD calibrations since they are set for compliance with the current federal OBD thresholds and would require potential rework to comply with the thresholds proposed today. Because this recalibration effort could be resource intensive, EPA requests comments on the level of burden and potential means of resolving this concern should it be warranted based on the burden imposed.

The automotive aftermarket industry is likely to argue that the provisions of today's proposal will impose heavy economic burdens on that industry. The automotive aftermarket has made claims of heavy economic burdens during development of the California OBD II regulations and the ensuing waiver process during which California requested a waiver from federal preemption for the purpose of enforcing their unique OBD program. In response to today's proposed revisions, the aftermarket

may argue that excessive costs will be incurred because the anti-tampering measures required under the California OBD II regulations will present more difficulty for the automotive aftermarket in carrying out their business of reverse engineering original equipment manufacturer (OEM) parts and designing replacement or specialty parts. However, EPA is not including CARB's anti-tampering provisions in its incorporation of California's regulations. Failure to incorporate these provisions still allows OEMs to voluntarily implement anti-tampering measures, but such is also the case under federal OBD. Moreover, CARB has eliminated the anti-tampering provisions considered most egregious by the aftermarket.⁵ Therefore, EPA believes that the provisions of this proposed rulemaking are not responsible for any potential increased costs on the automotive aftermarket.

The costs and emission reductions associated with the federal OBD program were developed for the February 19, 1993, final rulemaking. The changes being proposed today do not affect the costs or emission reductions published as part of that rulemaking, with the possible exception of decreasing costs for larger volume manufacturers.

VI. Public Participation

A. Summary of Specific Comments Requested by EPA

This section serves only to highlight the issues upon which EPA specifically requests public comment. This section does not preclude in any way the submittal of comments not requested here. Furthermore, this section does not provide details on the proposed requirements, nor potential issues surrounding those proposals; such detail can be found

CARB Mail-Out #96-34, proposed amendments to the California Code of Regulations section 1968.1, paragraph (d).

in sections III and IV, above.

1. Federal OBD Malfunction Thresholds

As discussed in section IV.A., the Agency is proposing changes to the current federal OBD malfunction thresholds. The Agency requests comment regarding the impact of these proposed changes on those manufacturers having proactively set out to meet the current federal OBD thresholds ahead of the 1999 model year. The Agency also requests comment regarding the impact of the proposed changes on small volume manufacturer who may not have any plans for California vehicle sales and have thus concentrated development efforts solely on the existing federal OBD thresholds. Furthermore, realizing that EPA has requested comment on the appropriateness of a two year grace period for those manufacturers having certified to the current EPA thresholds in the 1998 model year, EPA requests comment on how best to resolve the issue while also satisfying the Agency's desire to harmonize the federal and California OBD requirements.

The Agency is also requesting comment on the stringency of the proposed thresholds given that thresholds for some monitors will be relaxed somewhat, while others will become more stringent.

2. Expanded Federal OBD Monitoring Requirements

The Agency requests comment on today's proposed expansion of mandatory monitors under the federal OBD program. Of particular interest are comments from those manufacturers that have concentrated on designing a unique federal OBD system due to the more limited mandatory monitoring requirements.

Also of interest are comments from state Inspection and Maintenance program officials regarding their concern over the potential for OBD systems on vehicles that do not have all of the monitors currently required in the Californian OBD II program.

3. Extension of Allowance of OBD Deficiencies for Federal OBD Vehicles

As discussed in section IV.D., the Agency is proposing to indefinitely extend the current "deficiency" provisions of the federal OBD program. The Agency believes that this is a reasonable proposal given the intricate nature of OBD systems and the likelihood that minor software glitches will occur. Comment is requested on concerns regarding this proposal.

4. Extension of Provisions for Alternate Fueled Vehicles

The Agency is proposing that special OBD flexibilities be afforded to alternate fueled vehicle. Comments are specifically requested on the need for such flexibility, and the need for that flexibility to extend through the 2004 model year as opposed to a nearer term model year. Comments are also requested regarding EPA's expectation that bi-fuel alternate fuel vehicles (i.e., those vehicles with one fuel delivery system capable of operation on two different fuels or any combination of those fuels) and dual-fuel alternate fuel vehicles (i.e., those vehicles with two separate fuel delivery systems) have fully compliant OBD systems during gasoline operation.

5. Update of Materials Incorporated by Reference

As discussed in section IV.H., the Agency is proposing to Incorporate by Reference a series of standardized SAE and ISO procedures. The Agency is not aware of any issues surrounding the proposed Incorporation by Reference, but is open to any comments regarding this issue.

6. Cost Effectiveness

As discussed in section V, EPA is aware that some OEMs, particularly extremely small volume import manufacturers, have

concentrated their efforts on the unique federal OBD malfunction thresholds. Because the proposed changes may require recalibration efforts, and those efforts could be resource intensive, EPA requests comments on the level of burden and potential means of resolving this concern should it be warranted based on the burden imposed.

B. Comments and the Public Docket

EPA welcomes comments on all aspects of this proposed rulemaking. Commenters are especially encouraged to give suggestions for changing any aspects of the proposal. All comments, with the exception of proprietary information should be addressed to the EPA Air Docket Section, Docket No. A-96-32(see ADDRESSES").

Commenters who wish to submit proprietary information for consideration should clearly separate such information from other comments by 1) labeling proprietary information "Confidential Business Information" and 2) sending proprietary information directly to the contact person listed (see "FOR FURTHER INFORMATION CONTACT") and not to the public docket. This will help insure that proprietary information is not inadvertently placed in the docket. If a commenter wants EPA to use a submission labeled as confidential business information as part of the basis for the final rule, then a nonconfidential version of the document, which summarizes the key data or information, should be sent to the docket.

Information covered by a claim of confidentiality will be disclosed by EPA only to the extent allowed and by the procedures set forth in 40 CFR Part 2. If no claim of confidentiality accompanies the submission when it is received by EPA, the submission may be made available to the public without notifying the commenters.

C. Public Hearing

Anyone wishing to present testimony about this proposal at the public hearing (see "DATES") should, if possible, notify the contact person (see "FOR FURTHER INFORMATION CONTACT") at least seven days prior to the day of the hearing. The contact person should be given an estimate of the time required for the presentation of testimony and notification of any need for audio/visual equipment. Testimony will be scheduled on a first come, first serve basis. A sign-up sheet will be available at the registration table the morning of the hearing for scheduling those who have not notified the contact earlier. This testimony will be scheduled on a first come, first serve basis to follow the previously scheduled testimony.

EPA requests that approximately 50 copies of the statement or material to be presented be brought to the hearing for distribution to the audience. In addition, EPA would find it helpful to receive an advanced copy of any statement or material to be presented at the hearing at least one week before the scheduled hearing date. This is to give EPA staff adequate time to review such material before the hearing. Such advanced copies should be submitted to the contact person listed.

The official records of the hearing will be kept open for 30 days following the hearing to allow submission of rebuttal and supplementary testimony. All such submittals should be directed to the Air Docket Section, Docket No. A-96-32 (see "ADDRESSES"). The hearing will be conducted informally, and technical rules of evidence will not apply. A written transcript of the hearing will be placed in the above docket for review. Anyone desiring to purchase a copy of the transcript should make individual arrangements with the court reporter recording the proceedings.

VII. Administrative Requirements

A. Executive Order 12866

Under Executive Order 12866 (58 FR 51735, October 4, 1993), the Agency must determine whether the regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

- (1) have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities;
- (2) create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;
- (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or,
- (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

It has been determined that this rule is not a "significant regulatory action" under the terms of Executive Order 12866 and is therefore not subject to OMB review.

B. Reporting and Recordkeeping Requirements

Today's action does not impose any new information collection burden. The modifications proposed above do not change the information collection requirements submitted to and approved by OMB in association with the OBD final rulemaking (58 FR 9468, February 19, 1993; and, 59 FR 38372, July 28, 1994). The Office of Management and Budget (OMB) has previously approved the information collection requirements contained in 40 CFR 86.084-17 under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. and has assigned OMB control number 2060-0104 (EPA

ICR No. 783.35).

Burden means the total time, effort, or financial resources expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to a collection of information; search data sources; complete and review the collection of information; and transmit or otherwise disclose the information.

Copies of the ICR document(s) may be obtained from Sandy Farmer, Information Policy Branch; EPA; 401 M St., SW. (mail code 2136); Washington, DC 20460 or by calling (202) 260-2740. Include the ICR and / or OMB number in any correspondence.

C. Impact on Small Entities

The Regulatory Flexibility Act requires federal agencies when proposing a rule, to identify potentially adverse impacts of federal regulations upon small entities. In instances where significant impacts are possible on a substantial number of these entities, agencies are required to develop a proposed Regulatory Flexibility Analysis.

EPA has determined that it is not necessary to prepare a regulatory flexibility analysis in connection with this proposed rule. This rule will not have a significant adverse economic impact on a substantial number of small businesses. This rulemaking will provide regulatory relief to both large and small volume automobile manufacturers by maintaining consistency with California OBD II requirements. It will not have a substantial impact on such entities. This rulemaking will not have a significant impact on businesses that manufacture, rebuild, distribute, or sell automotive parts, nor those

involved in automotive service and repair, as the revisions affect only requirements on automobile manufacturers.

In the absence of the proposed rule, the expiration of the §86.094-17(j) provision allowing optional demonstration of compliance with California OBD II requirements to suffice for EPA certification purposes, would necessitate full vehicle manufacturer compliance with the current federal OBD requirements at §86.094-17(a) through (h), beginning with the 1999 model year. Manufacturers have thus far chosen to reduce their costs by producing vehicle OBD systems to California specifications, thereby avoiding the necessity of developing significantly different OBD calibrations meeting the existing federal specifications, for the non-California market. Because the proposed rule modifies federal requirements to capture many benefits of the California option, EPA believes that it reduces manufacturer costs over a no-action baseline for 1999 and later model years.

Further, figures provided by the U.S. Departments of Labor and Commerce show the estimated cost of vehicle changes to meet 1996 model year OBD II requirements to be less than 1% of total vehicle cost. Because these changes already incorporate increased monitoring that is required to meet California OBD II requirements and is also required by the proposed rule, the rule is not expected to significantly increase OBD system cost beyond the estimate given.

Therefore, the Administrator certifies that this regulation does not have a significant impact on a substantial number of small entities.

D. Unfunded Mandates Act

Under Section 202 of the Unfunded Mandates Reform Act of 1995 ("Unfunded Mandates Act"), signed into law on March 22, 1995, EPA must prepare a budgetary impact statement to accompany any proposed or final rule that includes a Federal mandate that may result in estimated costs to State, local, or tribal governments in the aggregate; or to the private sector, or \$100 million or more. Under Section 205, EPA must

select the most cost effective and least burdensome alternative that achieves the objectives of the rule and is consistent with statutory requirements. Section 203 requires EPA to establish a plan for informing and advising any small governments that may be significantly or uniquely impacted by the rule.

EPA has determined that the action proposed today would not include a Federal mandate that may result in estimated costs of \$100 million or more to either State, local, or tribal governments in the aggregate, or to the private sector.

List of Subjects in 40 CFR Part 86

Environmental protection, Administrative practice and procedure, Confidential business information, Gasoline, Incorporation by reference, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements.

Dated: May 14, 1997.

Carol M. Browner,
Administrator.

For the reasons set out in the preamble, part 86 of title 40 of the Code of Federal Regulations is proposed to be amended as follows:

PART 86 -- CONTROL OF AIR POLLUTION FROM NEW AND IN-USE MOTOR VEHICLES AND NEW AND IN-USE MOTOR VEHICLE ENGINES: CERTIFICATION AND TEST PROCEDURES

1. The authority citation for part 86 revised to read as follows:

Authority: 42 U.S.C. 7401-7671q.

Subpart A -- [Amended]

2. Section 86.1 is amended by adding the following entries in numerical order to the table in paragraph (b)(2) and by adding paragraph (b)(5) to read as follows:

§ 86.1 Reference materials.

* * * * *

(b) * * *

(2) * * *

Document No. and name	40 CFR part 86 reference
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SAE J 1850 July 1995, Class B Data	86.099-17
Communication Network Interface	

SAE J1877 October 1993, Recommended	86.095-35
Practice for Bar-Coded Vehicle	
Identification Number Label	

SAE J1892 July 1994, Recommended	86.095-35
Practice for Bar-Coded Vehicle	
Emission Configuration Label	

SAE J1962 January 1995, Diagnostic	86.099-17
Connector	

SAE J1979 E/E July 1996, Diagnostic	86.099-17
Test Modes	

SAE J2012 July 1996, Recommended	86.099-17
Format and messages for Diagnostic	

Trouble Code Definitions, Part C

* * * * *

(5) ISO material. The following table sets forth material from the International Organization of Standardization that has been incorporated by reference. The first column lists the number and name of the material. The second column lists the section(s) of this part, other than §86.1, in which the matter is referenced. The second column is presented for information only and may not be all inclusive. Copies of these materials may be obtained from the International Organization for Standardization, Case Postale 56, CH-1211 Geneva 20, Switzerland.

Document No. and name	40 CFR part 86 reference
ISO 9141-2 February 1994, Road vehicles -- Diagnostic systems Part 2	86.099-17
ISO 14230-4 April 1996, Road vehicles - Diagnostic systems	86.099-17

3. Section 86.094-21 is amended by removing and reserving paragraph (i).

4. Section 86.094-38 is amended by revising paragraphs (a) through (f) to read as follows:

§ 86.094-38 Maintenance instructions.

(a) through (f) [Reserved]. For guidance see § 86.087-38.

* * * * *

5. Section 86.095-35 is amended by revising paragraph (i) to read as follows:

§86.095-35 Labeling.

* * * * *

(i) All light-duty vehicles and light-duty trucks shall comply with SAE Recommended Practices J1877 "Recommended Practice for Bar-Coded Vehicle Identification Number Label," (October 1993), and J1892 "Recommended Practice for Bar-Coded Vehicle Emission Configuration Label," (July 1994). SAE J1877 and J1892 are incorporated by reference (see § 86.1).

6. Section 86.098-17 is amended by revising paragraphs (b)(2) through (j) to read as follows:

§86.098-17 Emission control diagnostic system for 1998 and later light-duty vehicles and light-duty trucks.

* * * * *

(b)(2) through (i) [Reserved]. For guidance see §86.094-17.

(j) Demonstration of compliance with California OBD II requirements (Title 13 California Code Sec. 1968.1), as modified pursuant to California Mail Out #96-34 (October 25, 1996), shall satisfy the requirements of this section, except that compliance with Title 13 California Code Secs. 1968.1(b)(4.2.2), pertaining to evaporative leak detection, and 1968.1(d), pertaining to tampering protection, are not required to satisfy the requirements of this section.

7. A new § 86.099-17 is added to read as follows:

§86.099-17 Emission control diagnostic system for 1999 and later light-duty vehicles and light-duty trucks.

(a) All light-duty vehicles and light-duty trucks shall be equipped with an on-board diagnostic (OBD) system capable of monitoring, for each vehicle's useful life, all emission-related powertrain systems or components. All systems and components required to be monitored by this section shall be evaluated periodically, but no less frequently than

once per Urban Dynamometer Driving Schedule as defined in paragraph (a) of Appendix I of this part, or similar trip as approved by the Administrator.

(b) Malfunction descriptions. The OBD system shall detect and identify malfunctions in all monitored emission-related powertrain systems or components according to the following malfunction definitions as measured and calculated in accordance with test procedures set forth in subpart B of this part. Paragraphs (b)(2) and (b)(3) of this section do not apply to diesel cycle light-duty vehicles or light-duty trucks.

(1) Catalyst deterioration or malfunction before it results in an increase in HC emissions 1.5 times the HC standard, as compared to the HC emission level measured using a representative 4000 mile catalyst system.

(2) Engine misfire resulting in exhaust emissions exceeding 1.5 times the applicable standard for HC, CO or NO_x; and any misfire capable of damaging the catalytic converter.

(3) Oxygen sensor deterioration or malfunction resulting in exhaust emissions exceeding 1.5 times the applicable standard for HC, CO or NO_x.

(4) Any vapor leak in the evaporative and/or refueling system (excluding the tubing and connections between the purge valve and the intake manifold) greater than or equal in magnitude to a leak caused by a 0.040 inch diameter orifice; and the absence of evaporative purge air flow from the complete evaporative emission control system.

(5) Any deterioration or malfunction occurring in a powertrain system or component directly intended to control emissions, including but not necessarily limited to, the exhaust gas recirculation (EGR) system, if equipped, the secondary air system, if equipped, and the fuel control system, singularly resulting in exhaust emissions exceeding 1.5 times the applicable emission standard for HC, CO or NO_x.

(6) Any other deterioration or malfunction occurring in an electronic emission-related powertrain system or component not otherwise described above that either provides input to or receives commands from the on-board computer and has a measurable impact on emissions; monitoring of components required by this paragraph shall be satisfied by employing electrical circuit continuity checks and, for computer input components, rationality checks (input values within manufacturer specified ranges) and, for output components, functionality checks (proper functional response to computer commands); malfunctions are defined as a failure of the system or component to meet the electrical circuit continuity checks or the rationality or functionality checks.

(7) Oxygen sensor or any other component deterioration or malfunction which renders that sensor or component incapable of performing its function as part of the OBD system shall be detected and identified on vehicles so equipped.

(c) Malfunction indicator light. The OBD system shall incorporate a malfunction indicator light (MIL) readily visible to the vehicle operator. When illuminated, it shall display "Check Engine," "Service Engine Soon," or a similar phrase or symbol approved by the Administrator. A vehicle shall not be equipped with more than one general purpose malfunction indicator light for emission-related problems; separate specific purpose warning lights (e.g. brake system, fasten seat belt, oil pressure, etc.) are permitted. The use of red for the OBD-related malfunction indicator light is prohibited.

(d) MIL illumination. The MIL shall illuminate and remain illuminated when any of the conditions specified in paragraph (b) of this section are detected and verified, or whenever the engine control enters a default or secondary mode of operation considered abnormal for the given engine operating conditions. The MIL shall blink once per second under

any period of operation during which engine misfire is occurring and catalyst damage is imminent. After no more than two such misfire detections, the MIL shall maintain a steady illumination when the misfire is not occurring and shall remain illuminated until the MIL extinguishing criteria of this section are satisfied. The MIL shall also illuminate when the vehicle's ignition is in the "key-on" position before engine starting or cranking and extinguish after engine starting if no malfunction has previously been detected. If a fuel system or engine misfire malfunction has previously been detected, the MIL may be extinguished if the malfunction does not reoccur during three subsequent sequential trips during which engine speed is within 375 rpm, engine load is within 20 percent, and the engine's warm-up status is the same as that under which the malfunction was first detected, and no new malfunctions have been detected. If any malfunction other than a fuel system or engine misfire malfunction has been detected, the MIL may be extinguished if the malfunction does not reoccur during three subsequent sequential trips during which the monitoring system responsible for illuminating the MIL functions without detecting the malfunction, and no new malfunctions have been detected. Upon Administrator approval, statistical MIL illumination protocols may be employed, provided they result in comparable timeliness in detecting a malfunction and evaluating system performance, i.e., three to six monitoring events would be considered acceptable.

(e) Storing of computer codes. The emission control diagnostic system shall record and store in computer memory diagnostic trouble codes and diagnostic readiness codes indicating the status of the emission control system. These codes shall be available through the standardized data link connector per SAE J1979 specifications as referenced in paragraph (h) of this section.

(1) A diagnostic trouble code shall be stored for any detected and

verified malfunction causing MIL illumination. The stored diagnostic trouble code shall identify the malfunctioning system or component as uniquely as possible. At the manufacturer's discretion, a diagnostic trouble code may be stored for conditions not causing MIL illumination. Regardless, a separate code should be stored indicating the expected MIL illumination status (i.e., MIL commanded "ON," MIL commanded "OFF").

(2) For a single misfiring cylinder, the diagnostic trouble code(s) shall uniquely identify the cylinder, unless the manufacturer submits data and/or engineering evaluations which adequately demonstrate that the misfiring cylinder cannot be reliably identified under certain operating conditions. The diagnostic trouble code shall identify multiple misfiring cylinder conditions; under multiple misfire conditions, the misfiring cylinders need not be uniquely identified if a distinct multiple misfire diagnostic trouble code is stored.

(3) The diagnostic system may erase a diagnostic trouble code if the same code is not re-registered in at least 40 engine warm-up cycles, and the malfunction indicator light is not illuminated for that code.

(4) Separate status codes, or readiness codes, shall be stored in computer memory to identify correctly functioning emission control systems and those emission control systems which require further vehicle operation to complete proper diagnostic evaluation. A readiness code need not be stored for those monitors that can be considered continuously operating monitors (e.g., misfire monitor, fuel system monitor, etc.). Readiness codes should never be set to "not ready" status upon key-on or key-off; intentional setting of readiness codes to "not ready" status via service procedures must apply to all such codes, rather than applying to individual codes.

(f) Available diagnostic data. (1) Upon determination of the first malfunction of any component or system, "freeze frame" engine conditions present at the time shall be stored in computer memory. Should a

subsequent fuel system or misfire malfunction occur, any previously stored freeze frame conditions shall be replaced by the fuel system or misfire conditions (whichever occurs first). Stored engine conditions shall include, but are not limited to: engine speed, open or closed loop operation, fuel system commands, coolant temperature, calculated load value, fuel pressure, vehicle speed, air flow rate, and intake manifold pressure if the information needed to determine these conditions is available to the computer. For freeze frame storage, the manufacturer shall include the most appropriate set of conditions to facilitate effective repairs. If the diagnostic trouble code causing the conditions to be stored is erased in accordance with paragraph (d) of this section, the stored engine conditions may also be erased.

(2) The following data in addition to the required freeze frame information shall be made available on demand through the serial port on the standardized data link connector, if the information is available to the on-board computer or can be determined using information available to the on-board computer: Diagnostic trouble codes, engine coolant temperature, fuel control system status (closed loop, open loop, other), fuel trim, ignition timing advance, intake air temperature, manifold air pressure, air flow rate, engine RPM, throttle position sensor output value, secondary air status (upstream, downstream, or atmosphere), calculated load value, vehicle speed, and fuel pressure. The signals shall be provided in standard units based on SAE specifications incorporated by reference in paragraph (h) of this section. Actual signals shall be clearly identified separately from default value or limp home signals.

(3) For all emission control systems for which specific on-board evaluation tests are conducted (catalyst, oxygen sensor, etc.), the results of the most recent test performed by the vehicle, and the limits to which the system is compared shall be available through the standardized data link connector per SAE J1979 specifications as

referenced in paragraph (h) of this section.

(4) Access to the data required to be made available under this section shall be unrestricted and shall not require any access codes or devices that are only available from the manufacturer.

(g) The emission control diagnostic system is not required to evaluate systems or components during malfunction conditions if such evaluation would result in a risk to safety or failure of systems or components.

(h) Reference materials. The emission control diagnostic system shall provide for standardized access and conform with the following Society of Automotive Engineers (SAE) standards and/or the following International Standards Organization (ISO) standards. The following documents are incorporated by reference (see § 86.1):

(1) SAE material. (i) SAE J1850 "Class B Data Communication Network Interface," (July 1995) shall be used as the on-board to off-board communications protocol. All emission related messages sent to the scan tool over a J1850 data link shall use the Cyclic Redundancy Check and the three byte header, and shall not use inter-byte separation or checksums.

(ii) Basic diagnostic data (as specified in sections 86.094-17(e) and (f)) shall be provided in the format and units in SAE J1979 E/E Diagnostic Test Modes," (July 1996).

(iii) Diagnostic trouble codes shall be consistent with SAE J2012 "Recommended Format and Messages for Diagnostic Trouble Code Definitions," (July 1996) Part C.

(iv) The connection interface between the OBD system and test equipment and diagnostic tools shall meet the functional requirements of SAE J1962 "Diagnostic Connector," (January 1995).

(2) ISO materials. (i) ISO 9141-2 "Road vehicles -- Diagnostic

systems -- Part 2: CARB requirements for interchange of digital information," (February 1994) may be used as an alternative to SAE J1850 as the on-board to off-board communications protocol.

(ii) ISO 14230-4 "Road vehicles - Diagnostic systems - KWP 2000 requirements for Emission-related systems" (April 1996) may also be used as the on-board to off-board network communications protocol.

(i) Deficiencies and alternate fueled vehicles Upon application by the manufacturer, the Administrator may accept an OBD system as compliant even though specific requirements are not fully met. Such compliances without meeting specific requirements, or deficiencies, will be granted only if compliance would be infeasible or unreasonable considering such factors as, but not limited to, technical feasibility of the given monitor, lead time and production cycles including phase-in or phase-out of engines or vehicle designs and programmed upgrades of computers, and if any unmet requirements are not carried over from the previous model year except where unreasonable hardware modifications would be necessary to correct the non-compliance, and the manufacturer has demonstrated an acceptable level of effort toward compliance as determined by the Administrator. Furthermore, EPA will not accept any deficiency requests that include the complete lack of a required diagnostic monitor, with the possible exception of the special provisions for alternate fueled vehicles. For alternate fueled vehicles (e.g. natural gas, liquefied petroleum gas, methanol, ethanol), beginning with the model year for which alternate fuel emission standards are applicable and extending through the 2004 model year, manufacturers may request the Administrator to waive specific monitoring requirements of this section for which monitoring may not be reliable with respect to the use of the alternate fuel. At a minimum, alternate fuel vehicles shall be equipped with an OBD system meeting OBD requirements to the extent feasible as approved by the Administrator.

(j) Demonstration of compliance with California OBD II requirements (Title 13 California Code Sec. 1968.1), as modified pursuant to California Mail Out #96-34 (October 25, 1996), shall satisfy the requirements of this section, except that compliance with Title 13 California Code Secs. 1968.1(b)(4.2.2), pertaining to evaporative leak detection, and 1968.1(d), pertaining to tampering protection, are not required to satisfy the requirements of this section, and 1968.1(m)(5.1), pertaining to alternate fuel vehicles, shall not apply.

8. A new section 86.099-30 is added to read as follows: **§86.99-30 Certification.**

Section 86.099-30 includes text that specifies requirements that differ from §86.094.30, §86.095-30, §86.096-30, or §86.098-30. Where a paragraph in §86.094.30, §86.095-30, §86.096-30, or 86.098-30 is identical and applicable to §86.099-30, this may be indicated by specifying the corresponding paragraph and the statement "[Reserved]". For guidance see §86.094.30." or "[Reserved]". For guidance see §86.095-30." or "[Reserved]". For guidance see §86.096-30." or "[Reserved]". For guidance see §86.098-30.".

(a)(1) and (a)(2) [Reserved]. For guidance see §86.094-30.

(a)(3)(i) [Reserved]. For guidance see §86.098-30.

(a)(3)(ii) through (a)(4)(ii) [Reserved]. For guidance see §86.095-30.

(a)(4)(iii) introductory text through (a)(4)(iii)(C) [Reserved]. For guidance see §86.094-30.

(a)(4)(iv) introductory text [Reserved]. For guidance see §86.095-30.

(a)(4)(iv)(A) through (a)(12) [Reserved]. For guidance see §86.094-30.

(a)(13) [Reserved]. For guidance see §86.095-30.

(a)(14) [Reserved]. For guidance see §86.094-30.

(a)(15) through (a)(18) [Reserved]. For guidance see §86.096-30.

(a)(19) introductory text through (a)(19)(iii) [Reserved]. For guidance see §86.098-30.

(b)(1) introductory text through (b)(1)(i)(B) [Reserved]. For guidance see §86.094-30.

(b)(1)(i)(C) [Reserved]. For guidance see §86.098-30.

(b)(1)(ii) through (b)(1)(iv) [Reserved]. For guidance see §86.094-30.

(b)(2) [Reserved]. For guidance see §86.098-30.

(b)(3) through (b)(4)(i) [Reserved]. For guidance see §86.094-30.

(b)(4)(ii) [Reserved]. For guidance see §86.098-30.

(b)(4)(ii)(A) [Reserved]. For guidance see §86.094-30.

(b)(4)(ii)(B) through (b)(4)(iv) [Reserved]. For guidance see §86.098-30.

(b)(5) through (e) [Reserved]. For guidance see §86.094-30.

(f) For engine families required to have an emission control diagnostic system (an OBD system), certification will not be granted if, for any emission data vehicle, assembly line vehicle, or other test vehicle approved by the Administrator, the malfunction indicator light does not illuminate under any of the following circumstances. Only paragraph (f)(4) of this section applies to diesel cycle vehicles where such vehicles are so equipped.

(1) A catalyst is replaced with a deteriorated or defective catalyst, or an electronic simulation of such, resulting in an increase of 1.5 times the HC standard above the HC emission level measured using a representative 4000 mile catalyst system.

(2) An engine misfire condition is induced resulting in exhaust emissions exceeding 1.5 times the applicable standards for HC, CO or NOx.

(3) Any oxygen sensor is replaced with a deteriorated or defective oxygen sensor, or an electronic simulation of such, resulting in exhaust

emissions exceeding 1.5 times the applicable standard for HC, CO or NOx.

(4) A vapor leak is introduced in the evaporative and/or refueling system (excluding the tubing and connections between the purge valve and the intake manifold) greater than or equal in magnitude to a leak caused by a 0.040 inch diameter orifice, or the evaporative purge air flow is blocked or otherwise eliminated from the complete evaporative emission control system.

(5) A malfunction condition is induced in any emission-related powertrain system or component, including but not necessarily limited to, the exhaust gas recirculation (EGR) system, if equipped, the secondary air system, if equipped, and the fuel control system, singularly resulting in exhaust emissions exceeding 1.5 times the applicable emission standard for HC, CO or NOx.

(6) A malfunction condition is induced in an electronic emission-related powertrain system or component not otherwise described above that either provides input to or receives commands from the on-board computer resulting in a measurable impact on emissions.

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